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# Medical Malpractice of Vestibular Schwannoma: A 40-Year Review of the United States Legal Databases

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**Objectives:** To analyze medical malpractice lawsuit trends pertaining to cases of vestibular schwannomas (VS).

**Methods:** Two major computerized legal databases (Lexis-Nexis and WestLaw) were queried and reviewed for evaluation of all the US state and federal court records from civil trials alleging malpractice between 1976 and 2016.

**Results:** A total of 32 VS cases were identified. Allegations were divided into four categories: misdiagnosis/delayed diagnosis (47%), postoperative complications (44%), failure of informed consent or information sharing (16%), and other (3%). Postoperative complications included facial nerve paralysis, myocardial infarction, meningitis, and intracranial hemorrhage. Judgment amounts ranged from \$300,000 to \$2,000,000. The specialist type was specified for 24 of the 32 cases (75%): neurosurgeons (n = 9; 37%), neurotologists

(n = 6; 25%), general otolaryngologists (n = 5; 21%), primary care physicians (n = 4; 17%), neurologists (n = 3; 12%), radiologists (n = 3; 12%), anesthesiologists (n = 2; 8%), radiation oncologists (n = 1; 4%), and general surgeon (n = 1; 4%). Of these 24 cases, (n = 9; 37%) two or more physicians were named as defendants in the lawsuit.

**Conclusions:** Enhanced physician-patient communication, ensuring proper and adequate patient consent procedures, and proper documentation are good practices that may decrease the likelihood of lawsuits. **Key Words:** Acoustic neuroma—Medical malpractice—Otolaryngology—Vestibular schwannoma.

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Vestibular schwannomas (VS), commonly referred to as acoustic neuromas (AN), are typically benign tumors of the vestibular portion of the eighth cranial nerve (or vestibulocochlear nerve), with an incidence rate of approximately 1 in 100,000 patients (1). This tumor grows 1 mm per year on average, and only half of all cases grow by 5-year follow-up (2). Given their slow growth, there are multiple treatment options including, the conservative “wait and scan” approach with repeated imaging and follow-up, surgical resection, and stereotactic radiation therapies (3). For patients electing for surgical intervention, the potential for

adverse events postsurgery are low, with 30-day postoperative morbidity and mortality from surgical management at 9.7% and 1%, respectively (4–6).

Within the field of otolaryngology, neurotologists generally manage patients diagnosed with VS, along with neurosurgical colleagues. However, it is typically the primary care physician, otolaryngologist, and/or neurologist to whom the patient presents with initial symptoms, such as unilateral sensorineural hearing loss, tinnitus, and vertigo (2). Unfortunately, initial presentation for VS can be delayed because it is a benign, slow growing tumor often with innocuous symptoms before diagnosis. If diagnosis is not made until the tumor is large, patients require treatment with surgical resection of the tumor. However, surgical resection can have significant complications, including facial paralysis, deafness, cerebrovascular accidents, meningitis, and death. In cases with adverse outcomes, the patient and/or family may look to initiate action against individuals they feel responsible for the unfavorable result, making it imperative to understand the situation surrounding the adverse outcome. To better understand the causes, circumstances, and outcomes of lawsuits involving VS, we

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performed an extensive review of malpractice litigations involving VS patients. The present study analyzes publicly available court proceedings from major legal databases on cases where patients pursued legal actions against their physician(s) regarding VS treatment.

## METHODS

With Institutional Review Board exemption, a retrospective analysis was performed using two major computerized legal databases (WestLaw; St. Paul, MN and LexisNexis; Irvine, CA) to identify state and federal trials alleging malpractice for VS from 1976 to 2016 in the United States. Assistance was obtained from professional law librarians at our institution's law school. The databases use Boolean operators in their search algorithm. Utilizing the search terms “((acoustic AND neuroma) OR (vestibular AND schwannoma)) AND (medical malpractice),” multiple cases were identified on LexisNexis and WestLaw. These databases contained documents from court proceedings, including court rulings.

Court records of the court case proceedings were thoroughly read and analyzed. All data, including allegations and case outcomes, were extracted. If the judgment or damages were made readily available in the court proceedings, they were included for analysis. As a result, 32 cases were subsequently identified that fit our study design and parameters.

## RESULTS

Of the 32 cases identified, only six (19%) listed the judgment amount for the case (Table 1). The amounts paid to the patients were \$300,000; \$560,804; \$950,000; \$1,250,000; \$1,625,000; and \$2,000,000. Allegations of why patients pursued litigation against their physician were divided into four categories: misdiagnosis or delayed diagnoses, surgical complications, failure of informed consent or information sharing, and other. The single “other” categorization was applied to one court case over the purported adverse effects of radiation leading to VS. Misdiagnosis or delayed diagnosis was the primary reason in 47% of cases ( $n=15$ ), followed by surgical complications in 44% ( $n=14$ ). The surgical complications included facial nerve paralysis, myocardial infarction, meningitis, and intracranial hemorrhage.

Notable cases in our current study include 2012 litigation in California where a “skull based surgeon” (trained in general surgery) claimed to surgically resect the VS and subsequently falsified pathology reports. Additionally, in 2005, in Ohio, a plaintiff filed lawsuit against both his otolaryngologist and internal medicine physician for misdiagnosing VS initially as Eustachian tube dysfunction and viral cochleitis.

Of the 24 cases (75%) where it was possible to discern physician specialties, the 34 physicians included neurosurgeons ( $n=9$ ; 37%), neurotologists ( $n=6$ ; 25%), general otolaryngologists ( $n=5$ ; 21%), primary care physicians ( $n=4$ ; 17%), neurologists ( $n=3$ ; 12%), radiologists ( $n=3$ ; 12%), anesthesiologists ( $n=2$ ; 8%), radiation oncologists ( $n=1$ ; 4%), and general surgeons ( $n=1$ ; 4%). Additionally, nine of these cases (37%)

listed two or more physicians as defendants in the lawsuit.

## DISCUSSION

We found in our current study that the majority (59%) of lawsuits pertaining to VS involved otolaryngologists, neurotologists, and neurosurgeons. Moreover, of the 32 cases identified, 18 (56%) ruled in favor of the defendant (i.e., the physician, hospital, or insurance company). This result is consistent with a large retrospective otolaryngology malpractice litigation study, finding that of the 198 cases surveyed, 58% were decided in favor of the defendant (otolaryngologist) (7). In addition, a previous study found that of the otolaryngology-related medical practice cases filed in the WestLaw database since 2008, 81.8% of otolaryngologists did not hold legal accountability for the clinical outcomes (8). In our study, most cases were related to misdiagnosis/delayed diagnosis (47%) or surgical complications (44%).

Routine surgical complications are not uncommon following VS resection (4,5). Additionally, litigation was often prompted after uncommon complications due to surgical intervention (e.g., hemiparesis, meningitis, excessive, or intracranial bleeding), rather than routine complications. Furthermore, the outcomes of numerous cases were directly influenced by legal issues (e.g., filing suit after statute of limitations expiration, or not meeting the burden of proof) rather than medical issues. This has been previously demonstrated in studies looking at facial nerve paralysis and the submandibular gland/duct (9,10).

Multi-disciplinary approaches to VS diagnosis and treatment, coupled with proper patient communication, consent, and documentation can help expedite treatment, manage expectations, and prevent future litigation. Additionally, because up to 12% of VS are incidental findings on magnetic resonance imaging, the implementation of protocols to ensure that proper communication between radiologists and the ordering physician is warranted (3). Discussing and documenting the consequences of VS, along with the risks and benefits associated with various management modalities such as “watch and scan,” radiation therapy, and surgical removal may prevent subsequent litigation.

Limitations of our study include the small sample size, likely due to the relatively small subspecialized field inherently tasked with treating VS. Additionally, although WestLaw and LexisNexis are professional databases for accessing case files, they are not comprehensive. It has been previously described elsewhere that cases compiled in these databases are provided willingly by counsel and typically are obtained for approximating litigation decisions and compensation (11). However, many cases are settled confidentially out of court and are therefore not documented in these databases. Also, some malpractice insurance carriers and integrated delivery networks (e.g., Kaiser Permanente) are litigated in arbitration rather than state or federal court. Therefore,

**TABLE 1.** Summary of key information on vestibular schwannoma's lawsuit allegations

Year	Federal/State	Issue	Category	Outcome	Sued Service
1976	South Carolina	VS patient initially misdiagnosed as brainstem glioma.	Misdiagnosis	Defendants' motion for summary judgment denied and case moved onto trial	Neurosurgery
1979	Federal	Patient underwent right suboccipital craniotomy for VS and intraoperatively required a tracheotomy. Following hospitalization, patient claimed that health staff did not wean off the tracheotomy appropriately, causing respiratory distress.	Surgical complications	Proceeded to trial	Hospital
1984	Missouri	Serviceman VS patient was initially operated on by civilian surgeon. Subsequent resection performed by military surgeon. Patient claimed to have not been aware of the surgery and to have not received informed consent. Case was dismissed due to series of military-specific laws.	Surgical complications and informed consent	Case dismissed	Neurotology and neurosurgery
1988	Illinois	Neurosurgeon removed VS; patient had total sensorineural hearing loss, total facial paralysis, and impairment of gag reflex with vocal fold paralysis. Subsequently developed meningitis.	Surgical complications	Plaintiff awarded \$1 million	Hospital and neurosurgery
1989	New York	Patient claimed being unaware of VS diagnosis following MRI and CT. There was a delay in further work-up that several years later showed VS. Subsequent operation resulted in permanent hearing loss, tinnitus, balance disturbance, and left facial weakness.	Surgical complications and informed consent	Plaintiff lost case because it was filed after the statutes of limitations had expired	Neurotology
1991	Connecticut	Patient filed suit against radiologist and otolaryngologist for medical malpractice in the diagnosis and treatment of a VS. Patient claimed that radiologist negligently failed to detect the VS on CT, and the otolaryngologist negligently failed to diagnose and treat the VS after sudden hearing loss. The VS and its subsequent surgical removal caused total unilateral hearing loss, facial paralysis, hemiparesis, and voice loss.	Misdiagnosis	Plaintiff lost case	Radiology and otolaryngology
1993	Utah	Patient claimed that primary care physician did not properly diagnose the VS.	Misdiagnosis	Jury denied the plaintiff's reason for litigation as unsubstantiated	Family physician

*(Continued on next page)**Otology & Neurotology, Vol. 40, No. 3, 2019*

TABLE 1 (Continued)

Year	Federal/State	Issue	Category	Outcome	Sued Service
1995	New York	Patient claimed that hospital did not properly diagnose VS.	Delayed diagnosis	Court approved the case to move forward to trial	Hospital
1996	Nevada	Patient sued primary care physician on basis of misdiagnosis and delayed diagnosis of VS despite symptoms.	Misdiagnosis	Defendant lost the case and plaintiff awarded \$950,000	Primary care physician
1997	Louisiana	Patient underwent VS resection and postoperatively had facial weakness, double vision, tinnitus, head discomfort, and developed residual neurological deficits. Later endorsed depression and oscillopsia and filed a lawsuit against the operating neurosurgeon.	Surgical complications	Plaintiff lost case because it was filed after the statutes of limitations had expired	Neurosurgery
1998	Illinois	Patient with parotid gland tumor underwent head and neck radiation and developed bilateral VS. Filing suit against radiation oncologist for inducing VS with radiation.	Other	Partial summary judgment stating 2/3 of the plaintiff claims were not legally substantiated—case did not go to trial	Radiation oncology
1998	Tennessee	VS patient underwent suboccipital craniotomy resection resulting in facial nerve palsy and arm/hand paralysis. Lawsuit filed against neurosurgeon and anesthesiologist for not disclosing something went wrong during surgery.	Surgical complications and informed consent	Proceeded to trial	Neurosurgery and anesthesiology
2002	Ohio	VS patient underwent craniotomy and developed VS recurrence. Patient suing neurologist for not disclosing recurrence which led to another surgery with complications.	Informed consent	Proceeded to trial	Neurology
2003	Louisiana	VS patient did not receive proper cardiac workup before craniotomy and subsequently experienced angina. Patient filed suit against the hospital and her neurologist for postoperative complications.	Surgical complications	Plaintiff's claims did not meet burden of proof and case dismissed without trial	Neurology
2003	Rhode Island	VS patient with Factor VII deficiency underwent posterior fossa craniotomy. Despite intraoperative correction of coagulopathy with FFP, several hours postoperatively developed an intracranial bleeding.	Surgical complications	Court ruled in favor of defendant	Neurosurgery
2004	New York	VS patient file suit against otolaryngologist for failure to order MRI in timely fashion.	Misdiagnosis	Plaintiff awarded \$2 million for pain/suffering and \$200,000 to spouse for loss of services	Otolaryngology

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TABLE 1 (Continued)

Year	Federal/State	Issue	Category	Outcome	Sued Service
2004	New York	Patient sued otolaryngologist and neurologist for failure to timely diagnose and treat VS, which was initially misdiagnosed as presbycusis.	Misdiagnosis	Case dismissed	Otolaryngology and neurology
2005	Federal	Patient developed seizures secondary to VS-induced brainstem compression and subsequent hydrocephalus that was undiagnosed despite hearing loss, loss of balance, facial hypoesthesia, etc. The case was confounded by an extensive history of hypertension, diabetes, and obesity.	Misdiagnosis	Plaintiff awarded \$1.625 million	Federal government
2005	Georgia	VS patient developed sigmoid sinus tear intraoperatively and hydrocephalus with “permanent brain damage” and short term memory loss.	Surgical complications	Proceeded to trial	Neurotology and neurosurgery
2005	New York	VS patient filed suit against radiologist and neurosurgeon for misdiagnosis.	Misdiagnosis	Court ruled in favor of defendant	Neurosurgery and radiology
2005	Ohio	Patient sued otolaryngologist for misdiagnosis with Eustachian tube dysfunction and viral cochleitis before correctly diagnosing VS.	Misdiagnosis	Plaintiff awarded \$560,803.79	Otolaryngology and internal medicine
2005	Minnesota	Patient filed suit against neurosurgeon and anesthesiologist for a broken central line/venous catheter left inside him/her during a craniotomy for VS removal, but found out 12 years after the surgery.	Surgical complications	Plaintiff did not meet burden of proof and case was dismissed	Neurosurgery and anesthesiology
2006	California	Neurofibromatosis patient with multiple cervical, pelvic, lumbar, retroperitoneal neurofibromas sued chief medical officer of insurance company for not approving surgery for neurofibromas, which were found on MRI during VS workup.	Misdiagnosis	Case dismissed	Insurance company
2006	California	Patient filed suit for postoperative complications after VS resection with subsequent sensorineural hearing loss, facial paralysis, and loss of balance. In addition, patient claimed severe shock, pain, suffering, and emotional distress.	Surgical complications	Court ruled in favor of the plaintiff to pursue full trial in the initially named Sacramento County court	Otolaryngology, neurotology, and radiology

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Otolaryngology &amp; Neurotology, Vol. 40, No. 3, 2019

TABLE 1 (Continued)

Year	Federal/State	Issue	Category	Outcome	Sued Service
2008	Washington	Patient sued neurotologist for negligence resulting in postoperative tinnitus from VS removal via suboccipital craniotomy.	Surgical complications	Court ruled in favor of defendant	Neurotology
2008	Federal	Veteran patient filed suit against Veterans Affairs for misdiagnosis of headaches that were being treated during service time, which were caused by VS found incidentally on an MRI.	Misdiagnosis	Case dismissed on grounds that it was not related to military service	Hospital
2009	Indiana	Patient sued primary care physician for mistreating and misdiagnosing initial symptoms of VS as sinusitis. Subsequently, visited an otolaryngologist and was diagnosed with VS and had a complication of left facial nerve paralysis from surgery.	Misdiagnosis	Plaintiff lost case because it was filed after the statutes of limitations had expired	Primary care physician
2009	California	Prison patient sued for delayed diagnosis and treatment of VS.	Misdiagnosis	Court ruled in favor of defendant	Hospital
2011	California	Prison patient with unilateral hearing loss and compressive/neurologic symptoms for years was eventually diagnosed with VS. There was postoperative facial nerve paralysis from surgery and radiation. Patient filed suit against the government for delayed medical care due to prisoner status.	Misdiagnosis	Settled outside of court	Federal government
2012	California	After surgical VS removal by skull base surgeon, postoperative MRI and pathology reports demonstrated that the intracranial tumor had been missed altogether and remained in the patient. Patient filed suit against surgeon for lying about taking out the tumor and for falsifying pathology reports.	Informed consent	Plaintiff awarded \$300,000 in punitive damages	General surgery-trained with "skull base surgery"
2013	Ohio	VS patient developed intracranial bleed after surgery and claimed that physicians did not order CT scan in a timely fashion.	Surgical complications	Case dismissed	Neurotology

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TABLE 1 (Continued)

Year	Federal/State	Issue	Category	Outcome	Sued Service
2013	Washington	Patient had VS surgery 4 years previous at another facility, with a second surgery to repair CSF leak. Four years postoperatively, patient developed bacterial meningitis with <i>S. pneumoniae</i> but lumbar puncture was not performed, resulting in fatality. Two infectious disease physicians testified that bacteria entered the surgical site and caused an abscess/empyema.	Surgical complications	Court ruled in favor of defendant	Hospital

MRI indicates magnetic resonance imaging; VS, vestibular schwannomas.

settled cases and those that were arbitrated before court proceedings were not included.

## CONCLUSIONS

Both surgical and non-surgical specialties are implicated in malpractice lawsuits involving VS diagnosis, surgical complications, and informed consent. Many VS malpractice lawsuits involved otolaryngologists and neurosurgeons, but other non-surgical specialties were also involved. Earlier VS diagnosis, improved outcomes, and enhanced physician-patient communication are critical elements of a risk management approach that may help prevent lawsuits. In addition, ensuring adequate patient understanding of the risks and benefits of various treatment options and documentation of such may help reduce exposure to litigation in VS cases.

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